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Conserving Arizona

The green dream of the Wild West

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Inside India's 'Napa Valley'

A unique winery in western Maharashtra is using a combination of water recycling, solar power and waste reduction to avoid the environmental damage linked to wine production in California, says **Joseph Mayton**

Turning left onto a paved road, the large signs reveals a change of atmosphere. For the past three kilometres, the dirt roads, thatched roofed shops and meandering cows have proved a common sight on the road from Nasik in India's western Maharashtra. But as you approach the Sula Vineyards, the picture changes completely.

On each side of the road is an expanse of land unlike any other in India. Here is wine country. Sula was the first vineyard to open in the area; bringing wine-making in India to the attention of the world. Already, it has garnered much attention, and visitors to the vineyard here in Nasik are able to see first-hand the effort to develop and make high quality wines.

'This is just tasty wine and I have already bought three bottles,' English visitor Thomas Ulman from Bristol told the *Ecologist* as he sat on the balcony overlooking acres of grapes. 'It is still unknown to many Western wine drinkers, but hopefully Sula will become a household name in the years to come.'

He is one of the few visitors to take a closer look at Sula's vines, getting a tour and a special tasting of the offerings in the process. Below the bar, where barman Rajeev pours glasses of their latest options, including an exquisite Shiraz, the rows of bottles move quickly with two workers sitting and watching each glass bottle as it passes by, ensuring all is in order.

But Sula has separated itself from the smaller vineyards who have set up shop



Bottoms up! Indian wine is proving popular abroad

in the area, which has quickly become popularly known as 'India's Napa Valley'.

The company's history is an intriguing one, with the first plants sown in 1999 from seeds smuggled into India via Sonoma in the Napa Valley. Sula then expanded from the original 30 acre family estate to about 1500 acres, both in Nashik as well as in nearby Dindori.

Since its inaugural crop in 1999, Sula has seen its distribution extend across India – and it is now pushing for international distribution.

R. M. Krishna, one of the Sula Vineyards guides and a manager of the facility at Nasik said that when they first developed the crop, they wanted to ensure they would deliver on two aspects of production, much as California wineries have done in recent years.

'If you look at our grapes and this land, it is not the most ideal for producing wine, but we have discovered that it can make top quality wines that compete with internationally accepted companies and vineyards,' he began, waving his hand at the endless rows of grapes that have become a staple of the Sula brand.

'We have a lot to offer now and are growing annually in our production and have won a number of awards,' he added.

Sula recently won silver for their Sauvignon Blanc at Decanter World Wine Awards 2011, and co-founder Rajeev Samant hopes for more growth, but this time, with the environment in mind.

'We have established ourselves as the top company in India for wines and are currently utilising recycled glass for our bottles and also ensuring that our waste does not cause unnecessary environmental destruction like it has in California,' he told the *Ecologist*.

Samant has experienced California's wine producing industry, which is home to some 90 per cent of the American market. In recent years, the industry has been working hard to overcome its considerable carbon footprint and is looking for sustainable ways to help tackle climate change.

According to a 2006 report published by the National Academy of Sciences, areas suitable for grape growing could be reduced by as much as 81 per cent by the end of the century

as a result of climate change.

Samant is keenly aware of the troubles facing California, which have convinced him and Sula to put back what they take. The excess water that results from wine production, he notes, is recycled and treated in order to 'maximise the reusing of all aspects of the process.'

One of the key aspects of this water recycling is to 'put back as much of the waste that comes with the production so it is not left in ditches to adversely affect the surrounding countryside,' Samant adds.

Pointing to California's troubles, Samant reveals that he watched as a number of American companies started to move towards eco-friendly wine production methods, and showed him that it was something Sula can achieve.

A number of wineries in Napa are taking advantage of new technologies that are reducing their carbon dioxide emissions – some by as much as four metric tons annually. Fetzer, the leading eco-winery in California, has erected a large solar power system, generating 1.1 MM kilowatt-hours of clean energy which equals the planting of nearly 200 acres of pine fir forest.

At Sula, they are utilising solar energy and biodiesel as much as possible, while in the rest of India, solar power is becoming increasingly popular. They already have a number of solar power stations that helps to reduce electricity costs and has improved their carbon footprint greatly.

But most important to Samant and Sula Vineyards is their 'clean-up' policy that sees waste contained to the grounds of the vineyard. India is notorious for its rubbish problem, which can be seen everywhere from Delhi to Mumbai. One of the least appealing consequences is that this waste seeps into the water supply, which is subsequently used for watering crops

For Sula, progress is tied to developing a local environmental consciousness that can take on the current status quo of large companies, who tend to regard India's countryside as

one large rubbish disposal zone.

Tour guide Krishna is excited about what Sula is doing for the local environment and its progress in 'giving back.' 'Sula makes certain all of our waste is properly disposed of and that it does not find its way into the water systems of Nasik,' he enthuses. 'Too often, large companies, especially outside the city limits in India, don't seem to take note of the surrounding environment, but we do.'

He said the vineyard does not overuse areas during its planting and growing process, ensuring that each season's crop of grapes is rotated from one growing area to another. 'This creates better soil and does not exhaust it – something we have seen in other parts of India and the world, where many vineyards simply use up the land they are on.'

Water conservation is key to improving the company's footprint. They have embraced green technology and improved hose nozzles, while

introducing highly efficient barrel washing and cleaning techniques as well as using ponds to store rainwater. All of this has seen the overall use of water drop dramatically.

Although Samant argues that there is still much to be

Sula was the first vineyard to open in the area; bringing wine-making in India to the attention of the world

done on the environmental practices at the vineyard; he believes Sula has shown that even in the largely dry ecosystem at Nasik, creating world-class wine with an environmentally friendly ethos is entirely possible.

'Sula will continue to be the leading Indian winery if we maintain our commitment to what we are doing, both in terms of wine-making and in our focus on local environment strategies,' he says, thoughtfully.

Across the vast expanse that is Sula Vineyards, rows of green grapes jut forth from a land that looks, at first glance, utterly unsuited to wine-making. Nevertheless, it is here that wine has been revolutionised using the latest technology to produce top class products, all with a minimal carbon footprint.

The tragedy of Tibet

Least known of China's many crimes against Tibet is the damage to the Tibetan plateau: dams, deforestation, mining, poaching and the dumping of nuclear waste. **Sylvia Downes** reports



Under threat: the majestic mountains of the Tibetan plateau

Much has been written about Tibet under Chinese rule: the religious persecution, the displaced people, the ongoing suffering of the Tibetan people but little has been said or written about the environmental damage the Chinese have inflicted on the plateau. This is a matter that concerns us all. In the same way that the damage to the rain forest affects the people of the entire planet so the damage to the Tibetan plateau has consequences for peoples far beyond the Tibetan borders.

During the 60 years of Chinese occupation there has been an ongoing mass damming programme on the many rivers flowing from the Tibetan plateau. The Indus, Mekong, Irrawaddy, Yangtze, Yellow, Salween, Brahmaputra, Karnali and Sutlej all rise in Tibet. The tributaries of these rivers are vital to millions of people on the Asian continent and sustain the life of, it is estimated, 47 per cent of the world's population. The rivers flow into 10 countries: China, India, Pakistan, Nepal, Bhutan, Bangladesh, Burma, Thailand, Vietnam, Laos and Cambodia. Recent severe floods in Pakistan, China and Bangladesh have been attributed to the damming of rivers on the plateau.

Parts of southern and eastern Tibet are home to some of the best forest reserves in the world. Some of these contain trees that have taken over 100 years to mature – reaching heights of more than 90 feet in the process. Nevertheless these forests are now being destroyed in the name of 'development'. Lorries loaded with felled trees roll towards the Chinese border every day. Tibet had 25.2 million hectares of forest in 1959. By 1985, 13.57 million hectares remained. Now, by China's own estimate, 80 per cent of the Tibetan forests have been destroyed.

Landslides and flooding

The Chinese government is aware of the environmental damage done to Tibetan forests and is trying to implement reforestation programmes. But so far - mainly due to the corruption of local officials, who would rather line their own - the reforestation initiatives have been largely unsuccessful.

Chinese environmentalists themselves

have pointed out that the destruction of Tibetan forests has resulted in soil erosion leading to deposits of silt which in turn leads to the rise of the riverbeds. The consequence of this, together with the damming projects, has been massive flooding and landslides downstream. The Yangtze flood in 1998, which claimed the lives of thousands was blamed by President Jiang Zemin on rampant deforestation on the Tibetan Plateau. The frequent flooding that devastates Bangladesh has also been directly associated with the deforestation of Tibet. Recent floods in the Indus valley are a direct consequence of the growing number of dams and accelerating deforestation on the plateau.

Before the Chinese invaded Tibet the people lived in harmony with nature. This eco-friendly way of life disappeared with the coming of a materialistic ideology. The invasion was followed by wide-spread environmental destruction: massive deforestation, overgrazing, uncontrolled mining, nuclear waste dumping, soil erosion leading to landslides and the destruction of many species of birds and animals.

Buddhism teaches the interconnectedness of all living things and prohibits the killing of animals. Before the Chinese invasion, the animal and birdlife was safe. Not any more. Now the Chinese actively encourage trophy hunting of wild species. Rare animals like the Tibetan snow leopard are hunted for their fur, which is sold on the international market for large sums of money. You can buy a permit to shoot an endangered Tibetan antelope for US\$35,000 or an argali wild sheep for \$23,000. Deer antlers, musk, bones and other parts of wild animals are used in Chinese medicine and many animals including blue sheep and wild yak are being poached by hunters to supply meat markets in China.

The Tibetan people, however, have suffered more directly from a series of disastrous 'agricultural reforms'. Because these 'reforms' have taken no account of the harsh climate they have led to wide-spread famine, unknown before the coming of the Chinese. One such reform forced the substitution of wheat (unsuitable for the climate) in place of barley, which has been the Tibetan staple since time immemorial.

Furthermore, intensive agricultural production has resulted in the loss of many medicinal herbs, plants and destroyed winter food supplies. The various ill-thought-out programmes have led to wind and water erosion and desertification. According to the Chinese authorities, 120,000 square kilometres of land in China and Tibet have become deserts as a result of human activity. Nevertheless interference in traditional and environmentally friendly farming methods continues. Chinese authorities are still forcing Tibetan farmers to use chemical fertilisers and insecticides. Many of these are harmful to the crops as well as to the environment.

Poisoned people

The Chinese agricultural policies are not the only ones that make life difficult for the Tibetans still living on the plateau. The once pristine landscape of Tibet is now subject to a series of Chinese 'development' projects. One of the worst is the hydroelectric station at Yamdrok Lake, situated south west of Lhasa. This project is causing a beautiful lake – sacred to Tibetans – to dry up. The development of the area has been going on since the 90s and it was early in 1993 that the fresh water springs first started to dry up. As a consequence the local villagers were forced to drink the water from Yamdrok Tso. It was only when the local people began to suffer from maladies such as diarrhoea, hair loss and various skin diseases that they realised the waters of their beautiful lake were disgustingly polluted. These people have forfeited 165 hectares of their land to a project that has caused them harm. It is estimated that within 20 years the lake will have drained completely.

Perhaps even more disturbing is the fact that Tibet has proved an ideal venue for the Chinese government's development of its nuclear capability. Tibet watchers have known for some time that China has been dumping nuclear waste on the plateau. Only recently have the Chinese authorities admitted it though. Last year it was announced on the official news agency that there was a 20 square metre dump for radioactive pollutants in Haibei Tibetan Autonomous Prefecture near the shores of Lake

POLLUTION

Kokonor, the largest lake in Tibet.

The first nuclear weapon was brought onto the Tibetan Plateau in 1971 and stationed in the Tsaidam Basin, north Amdo. The Tsaidam Basin is an ideal site for nuclear development. It has a high altitude and is isolated. Nuclear missiles have since been stationed at Nagchuka, 150 miles north of Lhasa and recently it was confirmed that there are three nuclear missile deployment sites in Amdo at Large Taidam, Small Tsaidam and Terlingkha. These sites house Dong Feng Intercontinental Ballistic Missiles with a range of 7,000 kilometres. One of the newest missile production centres is located at Drotsang 63 kilometres east of Siling. Anti frigate missiles are tested here on Lake Koklor.

The North Nuclear Weapons research and Design Academy is China's secret nuclear city, located close to the town of Halyan. A doctor who worked at a nearby hospital directly south of the nuclear city reported that seven children of nomads, whose cattle graze near the academy, developed cancer that caused their white blood count to rise uncontrollably. The symptoms were similar to those caused by radiation after the Hiroshima and Nagasaki bombings in 1945. Many women in this region have given birth to stillborn babies.

An underground missile storage centre is located at Payi town in Kongpo Nyingtri, TAR. Local people reported that during mock military exercises a large number of missiles were taken out of the complex, mounted on 20 trucks and fired at pre-arranged targets. There is a lot of talk about 'weapons of mass destruction' these days, but no one ever seems to mention China in this context.

But it is too simplistic to assume that the history of the Chinese occupation of Tibet has been a complete disaster for the Tibetans. At various times the Chinese government has tried to win over the people by improving the material wealth of the country. They have increased the average national income, developed industry and, in certain areas, improved living conditions. Many Chinese believe that they liberated the Tibetan peasants from exploitation by a medieval feudal state and a religious establishment.

Chen Kuiyuan, who at one time held the position of First Secretary of the



Devastation: once a place of Eden-esque beauty, the Tibetan plateau has been ravaged by over-development

Chinese Communist party and was the most powerful man in TAR (the Tibet Autonomous Region), said, 'The central committee of the Chinese Communist party and the State Council have been urging the Chinese people to fully support the rapid development of Tibet and to help the Tibetan people out of poverty and become rich.'

No one disputes the fact that Beijing has poured both money and resources into the Tibetan Autonomous Region. In 1997 Beijing's outlay for TAR was 3,300,009,776 Yuan. If this is looked at in terms of the population of Tibet, in 1997 Beijing gave every Tibetan, 1,410 Yuan (\$200).

In 1985 Beijing initiated 62 construction projects to coincide with the anniversary of the establishment of the autonomous region and in 1995, another 62 projects. The Chinese government points out that the economic development of Tibet has made most Tibetans materially better off than at any other time in their history.

But the truth is that the development of the Tibetan plateau was got at a price. And it is a price that we all might be compelled to pay.

Some environmental scientists believe that the destruction over the last sixty years of the Tibetan environment (damming of rivers, deforestation, and desertification) could be impinging on the climate of the entire planet. This is because the plateau, lying at

the altitude that it does, is closely bound up with the global jetstream. When the jetstream changes course, weather patterns also change. A modification in the jetstream can have dire consequences. A Pacific typhoon could be one, the El Nino phenomenon, another. As well as altering weather patterns, these cataclysmic events stir up the ocean floor and cause disruption to marine food chains. The livelihoods of many on the north and south America western seaboard depend on the sea so the prosperity of thousands of people can be affected jetstream activity. The droughts followed by severe flooding in Australia are a direct result of El Nino which also affects the monsoon - vital to South Asia.

Once, a land where the environment was pristine, a land where birds and animals prospered, Tibet has been exploited and industrialised by the Chinese to such an extent that the natural environment is ruined, perhaps for ever. Once a peaceful buffer state between India and China, Tibet now is militarised to the point of holding between 300,000 and 500,000 Chinese troops and up to a quarter of China's nuclear missile force.

Once, Tibet was hidden, isolated and mysterious. A secret land with a unique culture and environment on 'the roof of the world'. Lhasa, its capital was the 'forbidden city.' Now all this is lost and, perhaps, it is not just the Chinese that are to blame.

Gangster's Paradise: how poaching is fuelling crime in the UK

Rhino poaching is increasing in Africa while at home, gangs are targeting museums in an attempt to cash in on the trade. **Anna Taylor** investigates



On the edge of extinction: increasing numbers of Black Rhinos are falling prey to poachers

The poaching of rhinos for their horns, although certainly not a new phenomenon, is becoming an ever increasing threat to their survival.

Despite an international ban on the trade of rhino horn since 1993, media reports have documented a growing number of incidents over the past few years, cumulating in a record high of 448 rhinos killed in South Africa last year. Compared to the 333 animals that were killed in 2010 and just 15 animals a year on average only a decade ago, this is a worrying trend.

The sharp increase in recent years has been caused by the demand for horns for use in traditional medicine. Rhino horn has been used for centuries as a 'cure' for fever and rheumatism, but has become more popular as a growing affluent class in countries such as Thailand acquire more money to spend on these products. A belief also seems to have taken hold in Vietnam that rhino horn can prevent – or even cure – cancer, which, despite the lack of scientific evidence, has fuelled demand in this country too.

Rising prices

In consequence, the price of rhino horn has soared to around £60,000 per kilo, more than double the value

of gold and platinum, and has made it even more valuable on the black market than diamonds and cocaine.

Worse, the increasing value of rhino horn has now attracted the attention of dangerous organised criminal gangs. Always on the lookout for new and creative opportunities to make quick and easy money, they are now pursuing rhino horns held in museums, auction houses and private collections throughout Europe, including the UK.

Robbery and intimidation

These gangs are targeting premises, and carrying out 'research' – and even hostile reconnaissance – before stealing horns in overnight burglaries or 'smash and grab' style thefts in broad daylight. Since 2011, there have been 56 successful and 10 attempted thefts in the UK, Portugal, France, Germany, the Czech Republic, Sweden and Belgium.

Among the targets in the UK are Sworder's Auctioneers in Essex, where in February last year, thieves stole a mounted rhino head worth £50,000. This was followed in May by the theft of a head from the Educational Museum in Surrey, and two horns stolen from Ipswich Museum in July. Here, the thieves ignored the lavish gold burial masks in the Egyptian gallery and took only the horns, demonstrating their high value. Earlier this year, a display case containing a rhino horn was broken into during opening hours at Norwich Castle, but the thieves were disturbed by two members of the museum staff who managed to recover the horn, although the men escaped.

In Europe, a hunting trophy of a rhino head was stolen from a pub in the Austrian province of Styria just last month. Other targets include the Gothenburg Museum of Natural History in Sweden, the University of Coimbra in Portugal, a museum in Liege in Belgium, and just three weeks after that theft, a horn was also stolen from the Royal Belgian Institute for Natural Sciences in Brussels. In France, four thefts from museums occurred in 2011, including a particularly violent attack at the Museum of Hunting and Nature in Paris. The robbery took place in the middle of the day over one lunchtime, with local media reporting that a paralysing gas was used on

museum guards, who subsequently had to be treated in hospital.

At the Offenburg Museum in southwest Germany, rhino horns were stolen in February this year. Two people distracted the museum staff, while another two removed a rhino head from a wall. Just last month it was revealed that three Britons were stopped by Munich police in a stolen car, one of whom, thought to be from London, is accused of being involved in the crime.

Europol have been gathering evidence and intelligence on this new trend as part of their responsibility to monitor developments in the threat from organised crime in Europe. They have identified significant players in the theft of rhino horn as an 'Irish and ethnically-Irish organised criminal group, who are known to use intimidation and violence to achieve their ends.' The gangs involved are more commonly associated with drug trafficking, money laundering and smuggling, and have exploited international auction houses in the UK, France, China and the USA to sell the horns.

In response to this spate of thefts in Britain, the Natural Sciences Collections Association has listed some guidelines on their website for museums displaying rhino horns. They recommend that a security audit is carried out and 'if material is not secure it should be taken off display and put in a secure location.' They also advise not to publicise rhino material, as 'thefts have targeted rhino horn that is on display or has been publicised in some way.'

Forgeries

Many museums are also replacing rhino horns with replicas to deter the thieves. One museum taking this drastic approach to crime is the Natural History Museum at Tring. In August last year, two rhino horns weighing two kilogrammes each were stolen from their collection. Fortunately, the horns had already been replaced with fake horns that look almost identical to the real thing, after staff suspected that they were the subject of hostile reconnaissance just a week earlier. On the black market the horns would have fetched around £240,000, but the fakes were totally worthless.

Science, however, may prove the best way to catch those involved in these crimes. A pilot study is currently being undertaken by Dr Lucy Webster at Science and Advice for Scottish Agriculture and Dr Ross McEwing of TRACE Wildlife Forensic Network to create a rhino DNA database for museum specimens. A DNA profiling test is being developed to enable the identification of stolen horns seized by police, even if the horn is in powdered form. DNA will be taken from samples of rhino horn, collected by drilling a small hole into the base of the horn, and stored in the database. Dr Webster explains: 'The rhino DNA database of museum specimens, once established, will allow enforcement to test for a link between the recovered horn and specific theft incidents. If there is a match, investigation can be focused using other forensic evidence, witnesses and suspects from both the theft scene and the smuggling operation. This will help enforcement to untangle the supply chain and identify those responsible from the theft to the attempted shipment.'

Crime-busting technology

A DNA database is currently being used in South Africa to identify horns from white rhinos killed on game reserves and in national parks, so a museum database would have real potential to tackle the threat of robberies and burglaries from natural history exhibits throughout the country. The museum database could also allow for comparisons to be made between current wild rhino populations, and those from over one hundred years ago, so would be a useful tool for research purposes.

As long as demand for traditional medicine from the Far East continues, the price of rhino horn will remain high, resulting in more and more rhinos being killed in the wild. Yet criminals operating in the UK and Europe do not have to travel far to cash in on this lucrative trade. It can only be hoped that this growing problem of break ins and thefts from museums and other institutions can be tackled with increasing vigilance on their part, and the development of innovative scientific techniques.

Where next for the Greens?

After some of the biggest breakthroughs in their history, the Green Party now faces a leadership election so what happens now? Are the Greens ready to take the next big leap forward, asks **Bibi van der Zee**



Uncertain future? No one – not least the party faithful – is sure what the next steps are for the Greens

The mood of optimism and confidence at the Green party conference in March was palpable. Jenny Jones, the mayoral candidate, took the stand in a glittering silver jacket and told the audience to loud cheers: 'I think the progress we're making is so substantial! The BBC has decided that the Greens are now in the second tier for media coverage with the Lib Dems and I now stand an excellent chance of coming third!' Cue even more cheers. It really did feel like a sunshine moment. After all, the UK Greens now had an MP, two MEPs and minority control of Brighton and Hove council. Membership had been rising steadily (the man sitting on my right had just come over from the Lib Dems), and so had public donations.

Moreover, after a few years of limited political recognisability (the days of David Icke also thankfully long gone) the party had a star. Party leader Caroline Lucas's media profile was rising, significantly outstripping all the rest of the new parliamentary intake except perhaps Louise Mensch. She was managing to operate at an extraordinarily high level as an MP, already serving on the Environmental Audit Committee, the Energy Bill Public Committee and as co-chair of the APPG on fuel poverty, as well as half a dozen others, while also contributing regularly to debates in the house.

Bitter battles

Perhaps most importantly however, the Greens could talk about political and economic policies that no other party dared articulate. While Labour and the Conservatives split hairs over the rate of deficit reduction, the Greens were boldly calling for a Robin Hood tax, for progressive taxation, for an increase in corporation tax and in capital gains tax and a crackdown on tax havens. And while everyone else spun helplessly in the orbit of the quest for infinite growth, the Greens were in a position, surely, to open up a new, vital discussion about limits to growth and the steady state economy.

But within hours of Jenny's speech the mood had soured. The next significant meeting on the agenda was about Brighton and Hove councillors, who had recently concluded a long and bitter battle over their budget by voting with Labour and the Tories on the amended budget. Here bitter disappointment erupted. 'What is the point of being in power if you have no principles and do exactly the same as the Labour party?' roared one member. 'You should be ashamed of yourselves,' shouted another. Over the next few weeks several members would leave in protest. And soon afterward Lucas would step down as party leader. Were the old problems closing in again?

Founded in 1972 – the year that issues such as population growth and sustainability really began to register with politicians and the public – the Green Party (known as PEOPLE to start with) was always supposed to be about a different kind of politics. Attempts in the 80s, 90s and early noughties to modernise the party and move it into the mainstream became battles from which all emerged with scars but little progress. But in 2005, a group of members got together and began to talk strategy. 'Before then the party had mostly been run by people who wanted to do politics differently,' says Brighton councillor, Matt Follett, who was policy adviser during the general election. 'But to my mind that meant unsuccessfully. It seemed to me that we needed to be a bit more conventional here. It's all very well to win the argument but you can still be ignored. But if you take seats and votes then something in the mainstream will really begin to shift.'

The first change that needed to take place, thought the modernisers, was to have one leader in place instead of the longstanding Green party tradition of joint principals. Against some fierce opposition (to this day economic spokesperson Molly Scott Cato finds it 'disempowering for everyone') they successfully got the change through. Caroline – 'who had been initially nervous about the whole

idea', according to Follett – was duly elected leader, and then selected as parliamentary candidate in Brighton where the Greens had made a strong showing in 2005. And then the party began to really focus.

'The only way we could win Brighton Pavilion is by concentrating all our resources on one target,' explains Lucas, 'and that was quite a big ask for everyone else around the country but we really concentrated on this and that allowed us to do things that we'd never done before like focus groups, hoarding advertising, social media.' Gratifying election success was the result, followed a year later by a victory that some regard as even more significant; gaining minority control of Brighton and Hove council. A year on however, and the realities of political life have begun to emerge. It's these new realities that are raising, as the conference showed, difficult questions that must be answered.

Slow progress

The results of all the work have, for some, been disappointing. I spoke to a couple of members who have left recently, and they cited disorganisation, disillusionment after the decisions in Brighton and Hove, and a sense that if you were going to have to make compromises anyway, you might as well be with a party that has a chance of national election (Labour's revival after the local elections have certainly been a contributing factor here). Meanwhile some still in the party admit – off the record – to profound disappointment with the lack of strategy and clear thinking in the party since the two election victories. Some feel that Lucas has not been entirely successful in getting more recognition and understanding for green policies. And even the most enthusiastic party members are willing to admit that they are not entirely sure where the Green Party is headed next.

What, after all, is the plan? Having got this far where do the Greens want to go next? Lucas – still leader when I spoke to her – outlines thoughts



The Green Lady: Whoever replaces current leader, Caroline Lucas, will have big shoes to fill

about the collapse of the Lib Dems and concentrating resources on the Young Greens. She then lists the South West, the North West and the East as parts of the country that need to be focussed on. When I ask what the party's takeaway message is for voters, she says: 'we're working on it but social and environmental justice – although probably not those words – are probably the key elements.' The plan, in other words, is being worked on but is not fully in place.

Life after Lucas

Is this a problem? Well surely, most outside observers are entitled to suggest, the Greens should be making headway at the moment because if not now, when? Some members, including Adam Ramsay, insist that the leadership election will be a way to turn focus onto these issues, and members (Greens love a good discussion) see that as a wholly positive thing. 'For the last few years we've been either fighting elections or we've just finished elections,' says Ramsay. 'There is a discussion to be had, and I think this is exactly the right moment to be having it.'

Let's not worry that the elections will turn into an old-fashioned bunfight. In the last few years, after all, the Greens have shown that they have the ambition and discipline to change their party rules, and then get an MP elected. There is every reason to hope that they will choose wisely, and, as numerous

people have been quick to tell me, they have a number of excellent candidates to choose from. Let's assume, instead, that the elections proceed calmly and that a new leader is collectively approved. This new leader will head a party with several significant disadvantages. The Greens continue to be short of money, although they now have a professional fundraiser. They are also terribly disadvantaged by the UK's political system; Green parties in countries with proportional representation have made far more headway and Lucas is frustrated by the fact that there is no state political funding here: 'I can't believe we fight wars over democracy but we can't come up with 50p a year for funding.'

And there is and will always be a part of the party who are opposed to any kind of pragmatic politicking because the Green party is supposed to be about a different kind of politics. One ex member was deeply frustrated by the inability of some members to understand that it was not possible to leap straight from the current state of affairs to a post-growth ecological economy: 'Steps and compromises have to be made on the way, but some people won't accept that.'

But the Greens are also at a unique moment in their history, a moment when, if they are wise they can extend their influence further than they ever have. And, as I witnessed at the conference, the members, committed and passionate one and all, are the

party's greatest strength. Some might have criticised the Brighton and Hove councillors but many more also leapt to their defence. The discussion of policy motions was calm, organised, and democratic in the extreme. As one political activist I spoke to said: 'When I first got involved with the party I expected to find a bunch of argumentative hippies. Instead I found well-organised, thoughtful people who were making tiny resources go miles.' What's more, the Green Party also has a young generation coming through that any political party would be happy to include in its ranks. And they also have a wealth of older members who have spent an enormous amount of time thinking about environmental and economic issues such as a steady state economy, greener energy solutions and a post-growth strategy. And studies have shown that, taken anonymously and in isolation, Green policies are generally more popular with the public than those of the larger parties.

A great leap forward?

The combination means, potentially, a powerful argument along with the young legs needed to carry it to the streets. It is a combination that activists love but can it deliver a great leap forward? Lucas says, with characteristic honesty and thoughtfulness: 'I recognise that the trajectory of our political progress, the timeline is well behind where we need to be, in terms of the challenges that we need to address, and I'm trying to find an answer to that myself. We can't predict if change is going to happen but we need to make sure we're in the right place.' 'I suppose what you're saying,' I suggest, 'is that you're trying to at least provide some kind of answer if people do decide they want one?' She nods, thoughtfully. 'Yes I think that is what I'm trying to say. I'm trying to be as clear as possible what an alternative route would be for a more sustainable planet into the future.' The answer that the Greens proffer may not be the one we take. But without their contribution the conversation will not be complete.

How fair are your Fairtrade bananas?

The Dominican Republic's Fairtrade boom has helped banana growers but what about the industry's Haitian migrant workers? **Tom Levitt** reports on the plight of the forgotten people in the banana trade



Not so tasty: Dominican banana trees ready for planting



Hard times: Haitian migrants at work in the Dominican Republic



Like many young Dominicans, Federico left for the US when he finished school to look for work, ending up in a Spanish store in New York. After 20 years working seven days a week he grew tired of the long hours and yearned for his homeland and the tropical climate of the Caribbean.

He had heard about the booming banana trade with the export market growing fast, a cheap and plentiful workforce, and land and water in abundance. It seemed like an ideal opportunity, with money to be made for entrepreneurs willing to set up a plantation. Today he is half way towards his dream, 35 hectares of indigenous forest have been cleared with half already planted with banana trees. The other half will be up and running later this year, together with a new building to wash and pack the harvested bananas.

Not far away Jan Luis Moneta is still waiting for his dream: a work visa. He comes from Haiti, one of the poorest countries in the world, when he was

14 years old. After 30 years working on banana plantations, he is still classed as an illegal worker. With his meagre daily wage, Moneta cannot afford to live in anything more than a corrugated iron hut, with no water, toilet facilities or electricity.

Jan Luis is just one of many thousands of 'invisible' Haitian migrants working in the Dominican Republic's banana industry, where they make up an estimated 90 per cent of the total workforce [officially, 66 per cent]. Union activists told the *Ecologist* that 90 to 95 per cent of them are working in the country illegally.

Although their stories are wildly different, both Federico and Jan Luis have helped fuel the Dominican Republic's banana boom. The country is the UK's biggest supplier in value terms, with more than 50 per cent of all their bananas exported to our shores. The majority of these are Fairtrade, organic or both. Despite the economic downturn, overall Fairtrade sales in the UK grew by 12 per cent last year and have proved surprisingly resilient.

But by buying organic and Fairtrade bananas, are consumers in the UK really helping to improve conditions for workers and the environment on the ground as claimed? And is the switch to organic and Fairtrade providing a template for other banana-producing countries to replicate?

A favourite at breakfast and in packed lunches, the banana's unrivalled popularity has seen major supermarkets such as Tesco and Asda vying to offer the best deal. Between 2002 and 2008, a price war between major supermarkets saw the price of bananas plummet by up to 41 per cent. The price cuts are almost invariably kicked off by Walmart (owner of Asda in the UK) and have continued to this day. At one point in 2009, a price war led by German discounter Aldi resulted in the UK's lowest price ever: at 37p per kilo

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– one third of the price at the beginning of the decade.

A decision by Sainsburys and Waitrose to only source Fairtrade bananas from 2007 seemed to signal a change or at least a part change. In 2012 the Co-op followed suit. These decisions have contributed to creating a £150 million Fairtrade banana market, which accounts for one in three bananas sold.

The Dominican Republic has been one of the main beneficiaries of the Fairtrade boom. Its Fairtrade and organic banana industry has grown rapidly over the past decade with an estimated 60 per cent of banana production certified

organic and a nearly one quarter certified Fairtrade.

The principles of organic farming insist on fairness to all workers, while Fairtrade standards are meant to ensure fair payments to banana plantation owners and their workers, with the additional Fairtrade premium being spent on projects to help small producers and plantation workers.

While the health problems normally associated with banana plantations and daily contact with toxic pesticides and fungicides were not apparent in the Dominican Republic, the industry the *Ecologist* saw in the country was still one reliant on a migrant workforce paid poverty wages, living in slums and with no legal status. What's more, in an effort to tackle criticism of its treatment of illegal workers, the Dominican Republic government is now planning to force many of these migrants underpinning the banana industry to leave the country. The seeds of an organic, and latterly, Fairtrade industry in the Dominican

Republic were sown in the 1980s when private foundations from Germany encouraged organic cocoa production. Producers later switched to bananas. Growing consumer demand, together with technical support from multinational marketing companies, helped the banana sector grow considerably from the 1990s onwards.

The organic farms we visited had managed to replace often dangerous chemicals used to protect banana trees with a natural pesticide, a mixture of garlic and rotting vegetables. But the prevalence of black sigatoka (or 'leaf streak'), the fungal disease that wreaks havoc in banana growing countries across the world, is becoming a major problem, with farms regularly reporting losses of up to 30 per cent of their crop. The disease attacks the tree and can cut fruit production by half.

A particularly devastating outbreak in late 2011 wiped out an estimated 40 per cent of production in the main banana growing region. For smaller producers in particular, the growing prevalence



Pollution: Plastic waste is a huge problem – even on Fairtrade farms

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Forgotten: home is a wood or corrugated iron shack for many migrant workers

of diseases like black sigatoka make it a struggle to meet the low and non-chemical requirement in Fairtrade and organic standards. Larger conventional and organic farms in the country can afford to operate aerial spraying every 20 to 30 days to protect their crops.

Federico runs an organic plantation in the north-west of the Dominican Republic in the province of Monte Cristi. Like many organic farms he hopes to get Fairtrade certification soon too. Along with the neighbouring province of Valverde, this is the heart of the banana-growing industry in the country. One government official we spoke to estimated that a 90 per cent of employment in the area is related to growing, picking and packing bananas.

On his farm, Federico is proud of his chemical-free plantation, even as it expands onto more former forested land. The irony is that forested land can be converted straight into organic production whereas former conventional agricultural land would have to go through a two-year conversion period to remove traces of

chemicals in the soils.

He uses a mixture of roots and chicken manure to fertilise the plants, which means he loses out on the unnaturally large bananas of conventional farms. 'My smaller bananas are much healthier and stronger', says Federico. Like all other plantations, every bunch of bananas is protected by a plastic bag, although in his case dipped in a mixture of hot pepper, garlic and soap rather than pesticides and other chemicals.

The use of plastic bags in particular is one of the most wasteful parts of banana production. On both conventional and organic farms, they are used to protect the bananas from over-exposure to the sun and thrown out after three months. Disposal of the bags is badly regulated and local roads and rivers throughout the banana growing regions are strewn with plastic waste, white bags from organic plantations and blue chemical coated bags from the conventional ones.

Ironically, if it wasn't for the colour coded plastic bags covering the

bunches of bananas, it would be impossible to spot the difference between the organic and conventional farms. They often lie just metres apart (sometimes even on the same farm) and look identical in terms of layout, stretching for tens of acres with no attempt at mixed cropping or diversity to encourage natural wildlife. The monoculture landscape is little different to the oil palm plantations of south-east Asia which have devastated the once biodiversity-rich tropical rainforests of countries like Malaysia and Indonesia. 'This region has lost its biodiversity,' says Fasto Pena, director of Naturaleza, a local environmental group. 'It's equally bad on organic and conventional farms. Plantation owners need to look after the natural environment better so it is still there for us in the future.'

There is also a less visible side to banana production. As with the majority of banana growing countries, a key component of the growth in the Dominican Republic has been a cheap migrant workforce. When the Haiti

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Bananas for sale: *But the migrants who grow them can't afford to buy them*

earthquake struck in 2010, thousands fled across the border, ending up in the north-west banana-growing states. But a better life is unlikely to be found on a banana plantation.

Lying hidden off a main road, around 1,000 Haitian migrants live crowded together in a community of corrugated iron shacks. Most of them are young and male, some have families but no-one has water, toilets or electricity. Some of them have jobs. Some don't. Of the ones that do, nearly all work on banana plantations, including some for a well-known organic plantation. Most of the workers get 250 to 300 pesos a day when they work (about £4). 'It is barely enough to eat,' a group of young men tell us. 'It allows us one meal a day of beans and rice but is not enough to rent a house or look after a family.'

Nearby, off a main road near the town of Mao in Valverde, in another community of mainly wooden huts, live around 130 Haitian migrants. One of them, a 34-year-old Haitian Sabin James, told us he works on an organic

plantation and after 15 years in the country is still trying to get legal status. Even though he gets paid 300 pesos, Sabin can't afford to buy a US\$225 (8,800 pesos) passport that would give him access to social security. His company offers help to apply for one but won't help him pay for it. 'They say they are helping us but they know it's no help at all,' says Sabin.

'The companies don't want to know about workers or bother themselves with how much they earn, where they live or what they eat,' says Padre Regino Martinez, director of Asomilin. His organisation has been helping migrants get passports at a reduced cost of US\$140 and overcoming their fears of being deported if they try and apply. Padre says Dominican workers don't get paid more but were given fixed contracts and the opportunity for promotion to higher paid positions, which Haitians never occupied, leaving them trapped in poverty.

'They don't have enough to cover the costs of living. And have no way of

getting a higher salary to rent a home or buy a visa or passport. No power to negotiate with plantation owners. There are plenty of workers who need a job, so they are all too scared to stand up to employers,' says Padre.

Another migrant, Emmantel Audige was one of a number of workers we met living near the Haitian border and is employed on a Fairtrade certified banana plantation. He told us that he and other migrants had signed a contract for eight hours a day but actually worked six am to five pm without rest or overtime and for wages of no more than the average 250 pesos reported by non-Fairtrade workers. He said he had been in the country for 11 years but was still an illegal worker, with no rights to social security. All migrants can use state hospitals but we were told care was very poor, with long waiting times.

According to the Fairtrade Foundation the premium consumers pay for Fairtrade bananas has been used to help migrants get passports and

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working visas, however, Emmantel says he has no idea what the premium gets spent on. He and other migrants would like to have access to a healthcare centre to deal with work injuries and for use by their families. After one year workers should also get 14 days paid holiday but Emmantel says he gets none.

Even migrants like Jean Baptiste who has been working in the country in the banana sector for over 30 years - currently six days a week for an organic and Fairtrade certified plantation - are still forced to live in the community of wooden huts with no electricity, water or toilet facilities. Jan gets 280 pesos a day but says a fair wage would be 500 pesos (£8), something that would allow him to continue to live comfortably in the wooden huts with fellow migrants, but not enough to rent a home with water and electricity.

Back on his organic farm, Federico, who hopes to be certified Fairtrade, admits that some of his workers are illegal migrants with no work permits. He uses around 40 workers on day-to-day contracts, although he is not sure about where they live or their living conditions. He says his farm does not have enough money yet to help workers get visas or passports.

The Fairtrade Foundation in the UK acknowledges that migrant workers in Dominican Republic's banana industry need help in getting better housing, access to healthcare and legal status. It says many of the small-scale producers are often disadvantaged themselves and it takes time for them to assume more responsibility for the living conditions of migrant workers.

Trade union groups in the Dominican Republic say Fairtrade standards don't do enough to help migrant workers, who often slip through the net. 'There is no doubt that they are improving international trade but it isn't helping migrant workers to earn a fair salary,' says Luciano Robles, from the Trade Union Autonomous Federation (CASC). 'International standards need to be adapted to local situations.'

The Fairtrade Foundation says calls

for using the Fairtrade premium to subsidise migrant workers' wages may undermine the responsibility of farm owners and employers to tackle the 'living wage' issue. It points the blame, in part, at the continual use of bananas in price wars between supermarkets, saying it has devalued the fruit in the eyes of the consumer and left producers with low returns, even in the Fairtrade sector, which has to remain competitive against conventional alternatives. Although the minimum price for Fairtrade bananas has risen slightly in the past two years, the price wars make it harder than ever to improve the conditions of slum-dwelling Haitian migrants.

Campaigners are hoping the new supermarket watchdog, the Groceries Code Adjudicator, will help stop supermarkets pressurising their suppliers. 'Supermarkets are the most powerful actors along supply chains and make vast profits however the unsustainably low prices they pay to suppliers can leave the workers who plant, harvest and pack our food in poverty,' says Banana Link campaigner Anna Cooper.

While campaigners fight for a better standard of living for banana workers, there are fears many of the illegal Haitian migrants could soon be expelled. Tough new rules, which union groups say are politically motivated, state that at least 80 per cent of a firm's employees must be Dominican - a

figure at odds with the reality of the migrant-dominated banana industry. Government officials told the *Ecologist* this was to 'regularise' the workforce and ensure Haitians were legal citizens in the country. But it puts the plight of thousands of other illegal migrants in peril. 'Until now the Dominican Republic government has turned a blind eye to the presence of illegal Haitian workers, knowing the extreme difficulties they face in their own country and which can be partly solved by work here,' says Marike de Pena, from Banelino, a well-known Fairtrade producer group that sells bananas to many UK supermarkets.

She admits some of their small-scale producers may be using illegal workers but says the group wants more Haitian migrants to be able to stay in the country and get better wages and legal status. To that end, the Fairtrade Foundation, together with banana producers, have been lobbying the government to resolve the issue.

For now though, the difficulties for many migrants persist. 'The network of migration, exploitation and violation of rights is mutually beneficial for Haiti and Dominican Republic. There is even money to be made on the border from trafficking people. The institutions issuing visas, the Dominican economy and the banana industry getting cheap labour. Everyone benefits,' Luciano Robles told the *Ecologist*. Everyone but the Haitian migrants themselves.



The human cost of Fairtrade bananas: Haitian workers in the Dominican Republic

Awesome Arizona: the cowboy state goes green

photos: **Daniel Foss**

The cowboys and Indians are still there but there's more to America's 48th state than reliving the glory days of the Wild West. Home to seven different ecosystems, it's leading the way in conservation and green tourism. **Ruth Styles** packed her bags and headed to Arizona find out more.



Think of the United States and environmentalism probably isn't the first thing that springs to mind. Thanks to its climate change deniers, reliance on fossil fuels and failure to sign up to Kyoto – or indeed, any sort of green treaty – it's no surprise that the world's most powerful country is seen as a bit of a slouch in the eco stakes. But to write the country off as a flat earther's paradise wouldn't just be wrong – it would be unfair to boot. With California and New York leading the charge, the USA has plenty for environmentalists the world over to admire. And nowhere is the eco trend more apparent than in Arizona.

One of the most ecologically diverse places on Earth, the cowboy state boasts no fewer than seven different types of habitat, ranging from sun-scorched desert in the south to snowy mountains in the north. Of its 113,998 square miles, only 15 per cent is privately owned, with the rest made up of a combination of national park, publicly owned forest and parkland, and Native American reservations. It's got extinct volcanoes, huge ponderosa pine forests and most spectacularly of all, the Grand Canyon. With so much natural bounty to protect, it's small wonder that green tourism is playing an increasingly important part in the state's economy. And unlike Arizona's other major source of cash – copper mining – it benefits the planet in more ways than one.

Seeing the Grand Canyon for the first time is something you'll never forget. It doesn't matter how many pictures you've seen or books you've read, its sheer size – if nothing else – will blow you away. Formed almost a billion years ago, its red-gold rocks and mighty ravines are home to some of the rarest species of flora in the world – and some of its cheekiest fauna in the shape of the tubby ground squirrels that haunt the trails and picnic sites along the top. It's a place of almost unearthly beauty but until recently, could only be reached by car or plane. That there's an alternative is largely thanks to the efforts of one



Natural wonder: the red rocks of Monument Valley

man: Max Biegert. The Grand Canyon has had its own railway line since 1901 but by the 1980s, the route had fallen into disuse. When the Biegerts arrived in 1989, the Grand Canyon Railway's old-fashioned steam trains were rusting in the depot, while Williams – once the gateway to the Grand Canyon – had been sidelined. Thanks to the Biegerts, and more recently, eco-tourism operator, Xanterra, the train is back and this time comes with a green twist: it's powered by used cooking oil.

'It's definitely the greenest way to get to the Canyon,' enthuses the railway's director of sustainability, Morgan O'Connor. 'There was a study done by Northern Arizona University that showed it was by far the most

environmentally friendly way to go there. Because of it, 125,000 people a year aren't driving their car.' And getting to the Grand Canyon by train is more than just a green option: it's also a highly entertaining one featuring a slapstick 'train robbery' and the chance to get a closer look at the wonderful surrounding countryside. The scenery changes constantly, with the snow capped San Francisco Peaks giving way to the carmine Red Beaut escarpment then a forest of petrified pine trees before you reach the Canyon itself. You get a brief glimpse of it as the train pulls into the charmingly old fashioned, wooden Grand Canyon station, before a short walk takes you to the rim of

EXPLORE

the Canyon where you'll find one of the most magnificent views on the planet. 'There's still a lot more to be done in terms of sustainable tourism,' qualifies Morgan. 'But it's at the heart of our [Xanterra's] core mission.'

Down in the southern part of the state, close to the Saguaro National Park, is the White Stallion Ranch, an old fashioned dude ranch and cattle farm with a distinctly modern approach to sustainability. Reached via a long dusty track flanked by enormous cacti and even bigger rocky outcrops, it looks like the set of a John Wayne movie – albeit one with enormous solar panels outside. One of the most charming things about Arizona is the constant sense of déjà-vu – even if you haven't been before, you'll feel as if you have, so familiar are its southern desert landscapes to fans of Western films. At White Stallion, you're in real cowboy country, complete with chap-sporting wranglers, line dancing in the evening and ancient saguaro cactuses. Around the ranch is rocky tundra dominated by scrub and cactus, which nevertheless, manages to support an astonishingly large array of fauna, including coyotes, mountain lions and roadrunners. As far as the ranch and its visitors are concerned, the only way to explore is via an old West type of transport: horse power.

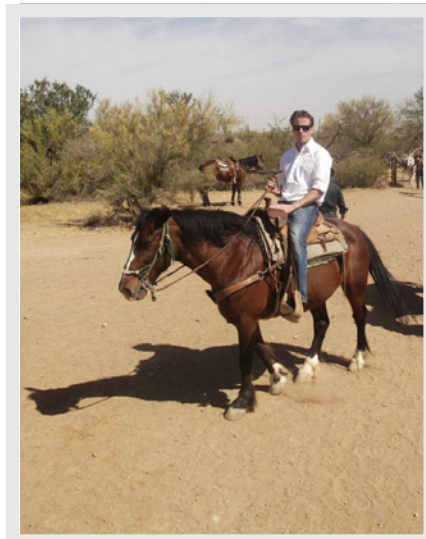
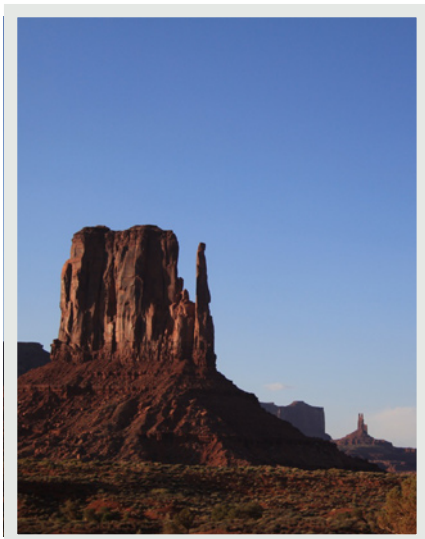
Home to 150 horses, as well as a large, free-roaming herd of cows, White Stallion lets you indulge any latent cowboy fantasies as well as



get to grips with nature without harming it. My horse, a grey Arab named Riata, had been a pet before coming to White Stallion, although others had rather more interesting histories. One, the aptly named Amigo, had been confiscated from Mexican drug smugglers, while another, the ancient 23-year-old Packer, had been a working animal all his life. Out on the trails spiralling out from the ranch, the silence was intense with only hoof beats and squeaking leather breaking it. Although less than 10 miles from Tucson, it's real American

wilderness, little changed since the first pioneers arrived and all the more valuable for it. Here, worries about the state of the planet were easily laid to rest. Up north in Flagstaff, however, it was a different story.

A picturesque little outpost on Route 66, Flagstaff is unique for having a town centre dating from the days of the old West, and for being home to the largest ponderosa pine forest on Earth. Flanked by the snow-capped San Francisco Peaks, its surroundings bear little resemblance to the dusty plains around Tucson but are just as



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biodiverse. Here, green travellers will find plenty to love, not least the lovely old-fashioned Starlight Pines B&B, which

offers a masterclass in upcycled interiors and one of the best breakfasts in Arizona. But there's a more serious

side to the environment to be found, and at Flagstaff Arboretum, preserving it is at the top of the agenda. Interim director, Lynne Nemeth, the woman charged with overseeing a wide array of conservation initiatives, was worried. 'Because of climate change, by 2090, all this could be gone,' she said, waving her hands gloomily at the surrounding pine trees.

At the Arboretum, work focuses on a combination of education and conservation, with visitors encouraged to think more carefully about water use and to take a responsible approach to enjoying the forest. 'Climate change is caused by humans and in general, human activity is the biggest threat to places like this,' adds Nemeth. 'We encourage people not to overuse the forest and to stick to "leave no trace" activities.' The two huge greenhouses onsite are used for cultivating rare endemic species with the aim of eventually returning them to the wild, not least to one of the nearby mountains where a



Cowboys and cactuses: home on the range at the White Stallion Ranch



All aboard! *The Grand Canyon Railway*

America As You Like It has a five night trip to Arizona starting at £1,320 per person. The price includes transport, two nights at White Stallion Ranch, one night at the Grand Canyon Railway Hotel (Williams), one night at the Starlight Pines B&B (Flagstaff) and one night at Goulding's Lodge (Monument Valley). Prices are based on two people sharing and a late June departure.

www.americaasyoulikeit.com

devastating fire destroyed much of its biodiversity. The resulting restoration programme is unique, and as Nemeth admits, it's been tough going. 'Part of the work we're doing is working out how to revegetate an area like this,' she explains. 'Our findings can be applied wherever this type of fire dependent eco-system exists but it will take years to fix.'

But it's not all doom and gloom in the northern part of the state. Along with success stories such as the Grand Canyon Railway and the pioneering work being done at the Flagstaff Arboretum, there's the successful conservation initiative that is Monument Valley. Part of the land belonging to the Navajo Nation, it, like Australia's Uhuru, combines the sacred with some utterly magnificent scenery. Largely untouched by the outside world until the 1930s, nothing prepares you for the first sight of Monument Valley's rocky red Mesas. On the dusty red road in, you pass a Mormon church and acres of flat rose-coloured sand before suddenly, asperous red slabs of rock rear up, some stacked like a colossal game of jenga. Many of them resemble people, animals or more specifically, mittens. As you wend your way through the park, it quickly becomes clear that the Valley is still home for many of the Navajo, with small wooden lodges nestling at the base of some of the rocks. As our guide, Howard, pointed out, here, life goes on much as it always has – albeit with a few extra people to show around.



Fishy Business: the illegal trade **in shellfish that's** risking your health

The illicit supply of clams, cockles and muscles could spark an outbreak of potentially fatal food poisoning. But, as **Andrew Wasley** reports, that hasn't stopped criminal gangmasters from attempting to cash in



Dangerous dining: Shellfish harvesting is a lucrative business

An underground trade in shellfish is putting public health at risk, with tonnes of potentially contaminated seafood entering the food chain, an investigation by the *Ecologist* has revealed.

The illegal harvesting of clams, cockles and oysters – among others – for sale to restaurants and wholesalers is becoming increasingly problematic and threatens an outbreak of serious food poisoning, according to health officials. Legitimately gathered shellfish are subject to strict purification treatment to ensure they are fit for human consumption but fish taken from prohibited or unclassified sources, or sold before being treated, put the public at risk of serious illness – including *E.coli*, novovirus and salmonella.

The scale of the illicit – and highly lucrative – trade has alarmed health officials and fisheries protection bodies who say they lack the resources to effectively tackle the problem.

Strict documentation is supposed to ensure traceability of any shellfish moved or sold on a commercial basis, with each batch accompanied by appropriate paperwork.

But the *Ecologist* has been told that in the event of a major health scare – such as last year’s deadly *E.coli* outbreak traced back to mung beans – officials would be unable to verify the origin of some shellfish because of the illegal trade, undermining efforts to pinpoint the source of contaminated produce.

Gangs

Highly organised gangs, some believed to be operating directly on behalf of fish merchants, others run by gangmasters, have targeted shellfish stocks in Sussex, Hampshire, Dorset, Merseyside, Lancashire, Cumbria and Teeside in recent years. Parts of north Wales and Scotland have also been affected.

The gangs target known shellfish beds day and night, depending on the tides. Many arrive in transit vans or 4x4 vehicles and, using spades – or in some cases small boats fitted with dredging equipment – extract the lucrative molluscs before transferring them to chill boxes.

From there, the shellfish are delivered to waiting merchants, or are offered for sale speculatively to traders, to restaurants or even via the internet. Some of the shellfish end up in markets for sale to the public, but most is thought to pass through processors or wholesalers who in turn sell to restaurants, pubs or other caterers, or export it abroad.

The legitimate shellfish industry is an important part of the UK’s food economy, worth more than £250 million. But enforcement bodies say the informal shellfish sector is associated with high levels of criminality and exploitation.

Threats and sabotage

The Gangmasters Licensing Authority [GLA] – set up following the Morecambe Bay tragedy in 2004 in which 23 Chinese cockle pickers drowned – recently warned it is stepping up its efforts to combat illegal gangmasters in the shellfish sector.

The move follows the prosecution of two gangmasters found to be operating without appropriate licenses. One had been controlling a number of Chinese workers harvesting shellfish in the Dee Estuary, another had been using Romanian migrants to pick shellfish on the Isle of Skye.

Poole Harbour, in Dorset, has abundant shellfish stocks and has seen an escalation in illegal harvesting in recent years, with sizable quantities of clams being taken from prohibited or restricted areas. The clam poachers work either alone or in pairs using boats to ‘fish in tight circles and use water to blast sand away [from the seabed]’, according to harbour officials.

There is currently between 15 and 18 boats licensed to harvest shellfish in the harbour – fishermen need to apply for a permit costing £300 – but as many as 50 boats are believed to be operating.

The harbour authorities have mounted a number of enforcement

operations in recent years and brought several prosecutions. One followed an undercover sting carried out using the controversial Regulation of Investigatory Powers Act, with a fisherman found guilty of taking undersized clams in restricted waters out of season.

The area the shellfish were taken from was believed to have high levels of *E.coli* and other bacteria that could pose a

threat to health.

Officials say the problem is difficult to thwart. ‘Because of the unlicensed activities [in Poole Harbour] we’ve stepped up our enforcement work, with officers

Fisheries protection officers have been threatened, buildings attacked and patrol boats sabotaged.

working on the ground, split patrols around the clock,’ one officer from the Southern Inshore Fisheries and Conservation Authority [IFCA], told the *Ecologist*. ‘We’ve nine officers and 1000 square miles [to police], all year around.’

Fisheries protection officers have been threatened, buildings attacked and patrol boats sabotaged during efforts to combat the problem, with parts of the harbour now regarded as being off limits for enforcement officers without police protection.

Much of the illegal fishing centres around Lytchett Bay – classified as a prohibited area for shellfish collection because of high levels of contamination. When the *Ecologist* visited Lytchett Bay, adjacent to the Turlin Moor residential estate, boats pointed out as being part of the illegal clam trade were moored up on the shoreline rather than working.

Several fishermen were working on the boats, and others were parked up in transit vans nearby. They didn’t want to be identified, concealing their faces when the *Ecologist* approached. When we later tried to make contact with the fishermen by phone, none would respond to our questions.

Officials describe the illegal fishermen as the same people ‘who’d be knocking off car stereos if they weren’t doing this.’ ‘You are dealing with people who don’t care,’ a Southern IFCA officer admitted

to us. 'They are organised, with look outs, with scouts... When [one of our officers] was parked up observing, they circled him.'

One legitimate shellfish producer based in Poole Harbour, who didn't want to be named, said: 'This is a vast problem that's been going on for years, they are not all nice people... some are organised, some less so.'

He said that rich financial rewards were driving the trade: 'They can harvest a 100 kilos, or even up to a tonne, in a day.' The fishermen said that in the past clams had fetched £1000 per tonne, although current market prices were lower.

Both fisheries officials and fishermen blame the problem on merchants and buyers. 'While the markets are still there, this is still a problem', a Southern IFCA officer said. 'We've got incitement by merchants, they even lay on the transport [for the shellfish].'

The *Ecologist* was told that several major fish buyers on the south coast were suspected of taking clams and other shellfish on a 'no questions asked' basis. Some are believed to directly 'order' shellfish and lay on the appropriate transport, chilling equipment and other gear; others will simply pay cash for whatever is brought in, depending on demand.

Raids and seizures

In a case officials described as 'worrying', one major shellfish merchant was earlier this year found to have taken delivery of clams harvested from an unclassified shellfish bed on the Sussex coast. The company sells direct to the public, supplies restaurants and is a wholesaler at London's Billingsgate Market. The world-famous market is a major hub for the seafood trade and supplies a number of top London restaurants.

The claims came to light during a recent trial at Worthing Magistrates Court where three men were found guilty of illegally gathering clams from beaches at Littlehampton and Rustington in early 2010.

According to Arun District Council, which brought the prosecution, the men delivered clams to the company



Buried treasure: digging for cockles, depicted in a Channel 4 documentary

on four occasions in April and May 2010 after being observed harvesting the shellfish on the Sussex beaches.

Officials found no evidence the company knew the shellfish were from an unclassified source.

The trial followed an investigation by the Gangmasters Licensing Authority and a series of raids in Sussex, Hampshire and at Billingsgate Market, which resulted in at least one arrest and a quantity of clams seized.

Officials had feared that any clams harvested from the Sussex beaches could be

contaminated with E.coli or other bugs as there are no classified shellfish beds in the region – and consequently no water testing undertaken for signs of contamination.

In the run up to the raid, local residents in Rustington had complained that organised gangs of clam diggers had been targeting the area's beaches for more than a year, 'turning up at low tide in cars, vans and, once, a mini coach, dressed in fishing clothing and carrying spades and buckets.'

One environmental health officer involved in the case said: 'They were doing this to put cash in their pocket – it's a bit like the scrap metal taken from railway lines.'

'All businesses are required to show

traceability of products supplied to them – with shellfish that's done by registration forms, they need paperwork for every consignment – but here there was a break in the chain,' explained the officer. The prosecution was part of a 'much bigger issue.'

Nat Slade, of Arun District Council's environmental health department, confirmed that approximately 2.2 tonnes of clams were illegally harvested in a three month period between February and May 2010, although he said the volume could have been much higher.

'They [the harvesters] were doing this to put cash in their pocket, it's a bit like the scrap metal taken from railway lines.'

Lack of traceability

By law, all commercial batches of shellfish destined for human consumption are supposed

to be accompanied by movement documentation forms issued by local authorities, detailing, amongst other information, the name of the harvester, the boat used and the area the shellfish have been taken from.

But environmental health officials say the system – with forms filled in by the harvester (although in some circumstances the buyer can now complete the paperwork) – is inadequate and open to abuse.

'We give them [the forms] continually to our legitimate guys, relatively few to small clam fishermen, some

to merchants,' a Dorset-based environmental health officer told the *Ecologist*. 'But based on the volume of fish appearing, our documents issued wouldn't cover it. The fact that they are self completed means they are not very useful from an enforcement point of view,' the officer said.

The environmental health officer added that while the majority of shellfish harvested from Poole Harbour were legitimately caught, it was possible for unscrupulous fishermen to bypass the whole system.

'If there's a market, the bigger the business, the more they have [to gain].

I suspect quite a lot of the C grade stuff [from waters with higher levels of contamination] is not going for heat treatment.'

The officer said the onus was on the merchants to check the

origin of fish they buy. 'They could check they are buying from properly licensed boats, they can check the sizes and the classification if buying a lot out of season,' he explained.

In north Wales, the Environment Agency is looking to introduce a voluntary code of practice for shellfish buyers to help combat the problem.

The agency recently warned that illegal cockling on the Dee Estuary is on the rise and said that it had brought 12 prosecutions – and suspended 15 licences – in recent months. The body estimates that approximately 20 tonnes of illegal cockles were seized.

'This type of illegal activity threatens the livelihood of licensed cocklers and can be incredibly dangerous to people who may be unfamiliar with the tides,' Environment Agency spokesman Dylan Williams said. 'We strongly advise people not to try and take cockles illegally as they put themselves at risk of harm and of being prosecuted.'

One police wildlife liaison officer working with the Environment Agency said the major concern was that cockles gathered illegally could be mixed in

with legitimately caught shellfish: 'It's like the E.coli case [with beansprouts], in the event of a health scare, the cockle industry would have no idea where some of them came from.'

Health warnings

In 2011, a deadly E.coli outbreak – first blamed on cucumbers and later linked to German grown bean sprouts – killed at least 22 people and poisoned more than 2000 across Europe.

Shellfish are frequently associated with instances of food poisoning, particularly when eaten raw or inadequately cooked, as they ingest

viruses and bacteria that are potentially harmful to humans.

Although it is not illegal to harvest shellfish for personal consumption, strict food safety regulations

make it an offence for molluscs to be gathered from unclassified fisheries and then sold on a commercial basis.

European hygiene regulations insist that waters used for commercial shellfish harvesting or cultivation are regularly tested for bacteria or virus levels, with different classification categories stipulating what processes fish harvested must go through before being safely consumed.

Last year, research by the Food Standards Agency found traces of novovirus – or winter vomiting bug – in more than three-quarters of shellfish tested from UK beds, much of which is eliminated by treatment and cooking.

In 2009, the Michelin-starred Fat Duck restaurant, owned by celebrity chef Heston Blumenthal, was forced to close after more than 450 people fell ill with norovirus. Raw oysters and clams were later identified by the Health Protection Agency as being the main source of the contamination, although there's no suggestion that shellfish from unlicensed sources were to blame.

The Food Standards Agency told the *Ecologist* that it received 'regular'

reports of illegal shellfish harvesting, and warned of the risks the trade poses to consumers.

'Shellfish bought from illegal sources will not have been subjected the checks which ensure it is fit for human consumption. Shellfish from approved beds are monitored to ensure they meet standards for microbiological contamination, including E.coli and Salmonella, chemical contamination, as well as algal toxins... consumers will therefore have no guarantee that illegally harvested shellfish is free from such contamination and are risking their health if they eat it,' Linden Jack, head of food hygiene policy at the Food Standards Agency said.

The Health Protection Agency said that at least 163 food poisoning outbreaks recorded between 1992 and 2010 were linked to shellfish. And it pointed to research published in the journal *Emerging Infectious Diseases* in 2005 which claimed that more than 77,000 cases of food-borne disease were linked to consumption of shellfish between 1996 and 2000.

Organised crime

In north Wales – and the north of England – the shellfish sector is increasingly associated with organised crime, say enforcement bodies. In the Dee Estuary, all of the individuals involved in illegal shellfish gathering are understood to be 'known to the police.'

'If there's money to be made, one day it could be drugs, then it's something else,' a police wildlife liaison officer said.

The picture is the same across the water in Merseyside and the Wirral which has 'chronic problems' with illegal harvesting. 'We've had 80 people out there, with 4x4's and quads,' a spokesman for the Mersey Port Health Authority confirmed. 'We get reports of between 10 and 15 tonnes [of cockles] being carted off the beach in one go.'

In one particularly audacious 'harvest', a gang of more than 50 people in a convoy of 4x4 vehicles carted off more than 10 tonnes of cockles from Wirral in August 2010. It is believed the haul was later transported to the neighbouring county of Lincolnshire for processing.

In Teeside, gangs of Chinese migrants

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Killer clams: Shellfish are increasingly popular but how safe are they?

have regularly been digging large quantities of cockles from unclassified waters around Hartlepool Marina and nearby areas. Much of the shellfish is believed to have been sold 'through the back door' to local restaurants. The size of the problem has prompted fisheries officials to rush through emergency bylaws to try and thwart the trade.

Last autumn, dozens of illegal cockle pickers targeted Morecambe Bay, scene of the 2004 tragedy which saw 23 Chinese migrants drown, and prompting fears of another disaster. In Lytham, in Lancashire, a 'gold rush' followed the reopening of the area's abundant shellfish beds, with many harvesters having to be rescued after getting into difficulties, thanks to incoming tides.

Prosecutions

The Gangmasters Licensing Authority this month warned it remained 'active' in targeting illegal gangmasters working in the shellfish sector. The move follows two separate prosecutions.

Peter Lackey, of Ulverston, was found guilty of acting as a gangmaster without a licence at Wirral Magistrates Court. Lackey was found to have been controlling a number of Chinese workers harvesting shellfish in the Dee Estuary in December 2010 and February 2011. On one occasion his vehicle, used to transport Chinese workers, became stranded in incoming waters and was later wrecked by seawater.

Margaret McKinlay, GLA Chair said: 'The GLA is active in this industry, and will continue to be so. This is essential because those who break the law place the lives of individuals at risk. The evidence of Mr Lackey's Land Rover speaks for itself; any worker transported in it was at risk. Mr Lackey knew he needed a licence. He took a risk that he would not be caught. It has cost him more to evade the law than be compliant. This is a lesson to all those gangmasters in the shellfish industry that think they can flout the law.'

In a separate case, Vitalie Cacicovschi,

from Portree, pleaded guilty to trading as an unlicensed gangmaster on the Isle of Skye. The prosecution was brought after 16 migrant workers, many of them Romanian, complained about their poor treatment while working as shellfish pickers with Mr Cacicovschi.

Enforcement bodies are increasingly concerned about the rise of illegal shellfish harvesting in Scotland. Cockle poaching on the Solway has recently been described as being 'out of control', prompting calls from Alex Fergusson, MSP for Galloway and West Dumfries, for urgent government action to tackle the problem:

'There's a huge public health issue here,' he told the *Ecologist*. 'This is organised at a fairly high level, you have gangs being dropped off [to harvest cockles], and a reluctance on the part of locals to report the problem to authorities.'

Fergusson added that there appears to be a lack of proactive action by the government, the marine authorities and the police to tackle the gangs involved. 'There's dozens of people involved, so [the shellfish] are getting into the food chain somehow.'

Those who break the law place the lives of individuals at risk.